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ABSTRACT

The degree to which cooperative education is a viable educational and/or financial aid mechanism for institutions of higher education to adopt is examined in this research report. A postsecondary co-op program is defined as one in which the institution takes primary responsibility for providing the student with a series of experiences in which academic and on-the-job learning is integrated. This study also determined the effectiveness of the federal role in supporting cooperative education through Title IV-D of the Higher Education Act. Four segments of the program include: (1) an examination of the costs and benefits of cooperative education for the three key sets of participants--the student, employer, and institution; (2) a determination of the degree to which cooperative education is a viable career education mechanism; (3) an assessment of the national potential for the expansion of cooperative education in postsecondary institutions; and (4) as assessment of the federal role in promoting the growth of postsecondary cooperative programs. Program and policy implications are also addressed. (LBH)

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COOPERATIVE EDUCATION - A NATIONAL ASSESSMENT

Executive Summary

Covers Period of Performance
During
July, 1975 - November, 1977

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EXECUTIVE SUMMARY

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I. INTRODUCTION AND OVERVIEW OF COOPERATIVE EDUCATION

Cooperative education (co-op) is still a relatively recent phenomenon. While its roots now go back over a half a century, the real growth in the cooperative education movement took place only within the past few years, with the early 1970s as the start of a dramatic upsurge in the extent of its growth. While early precursors of the cooperative form of education, such as the apprentice system, have been in existence for hundreds or even thousands of years, the origin of cooperative education is often credited to Dean Herman Schneider who, in 1906, established a program at the University of Cincinnati in which engineering students received their training by alternating periods of classroom training with periods of full-time work in engineering companies.

Fifteen years later, in 1921, Antioch brought its liberal arts college into this new educational concept, becoming the first non-engineering institution to offer co-op. In 1924, the first industry-sponsored program was started when a cooperative education program was established at the General Motors Institute. Growth over the next four decades was very slow. In 1962, there were still only about 50 institutions offering cooperative education, primarily 4-year schools, and with the programs largely confined to the areas of engineering and business. However, over the next 15 years a tremendous spurt in growth occurred, both in number of schools and in the expansion into new areas and non-traditional forms of cooperative education. By 1971 there were an estimated 250 colleges offering co-op; and in 1973, after the Title IV-D program reached its fully-authorized funding level, 576 co-op programs were operational or in the planning stage. Currently there are over 1,000 institutions of higher education with co-op programs.[1/] With this rapid growth in the number of co-op programs also came an increase in the variety of institutions offering co-op in which it was offered, and in the program structures.

Just what is a postsecondary co-op program? While there are many different types of programs, what nearly all have in common is a commitment on the part of the institution of higher education (IHE) to take primary responsibility for providing the student with a series of experiences in which academic and on-the-job learnings are integrated. In addition, there is often an arrangement--either informal or written--among a student, an employer, and an institution. Typically this arrangement includes the following:

[1/] Wilson, James, Undergraduate Program of Cooperative Education in the United States and Canada, Fifth Edition. The Cooperative Education Research Center, Northeastern University (Boston), 1977.

- The student agrees to participate in a series of planned work experiences throughout his/her school career. He/she also agrees to comply with the school's requirements for the co-op work experience which may include participation in a seminar course, and/or the submission of a report at the end of the work experience.

- The employer agrees to retain the student for a specified period of time. The student's salary, benefits, and working hours are stipulated. Sometimes the agreement also covers the range of learning and work experiences which will be provided to the student.. While not all work experiences are paid, the great majority of them are, and this study included only paid work experiences.

- The institution agrees to monitor the work experience usually done through periodic visits to the work site, to provide the student with support in the form of counseling or remediation should needs of these types be identified, and to attempt to ensure, through contact with the employer, that the work experience is also a learning experience. Typically, the institution also agrees to grant academic credit for the work experience, and they usually charge the student tuition in return for the academic credit and support services.

The importance of this three-party agreement cannot be overstated. It is this agreement which differentiates cooperative education programs from ordinary part-time employment and from work-study programs.

Until a few years ago, most co-op programs focused on engineering or business occupations, concentrated on the 4-year schools (some of which required a fifth year for co-op students) in which engineering and business degrees were offered, and involved schedules in which students alternated periods of full-time study with periods of full-time work.

Recently, however, the growth of co-op in 2-year schools has been such that the 2-year co-op programs now constitute almost half of all postsecondary co-op programs.[1/]

Similarly, the program areas are changing radically. As this report will show, the growth areas for co-op are in the liberal arts and in program areas associated with 2-year community colleges including the trade and industrial occupations (auto repair, air conditioning maintenance, electronics technician programs, etc.), the 2-year health occupations (licensed practical nurse, dental assistant, laboratory technician, etc.), and the 2-year business occupations (bookkeeping, clerical, non-CPA accounting, etc.).

1/ Wilson, ibid.

Equally, the program structures are changing rapidly. Whereas 15 years ago most co-op programs involved students alternating periods of full-time school work and full-time employment, this type of structure is now losing ground quickly with more and more schools offering parallel co-op programs in which students go to school part of the day and work part of the day. In addition, a third alternative has emerged--the so-called one-shot program--in which students are permitted to engage in a single, either full-time or part-time supervised work experience after completing their course work in their academic discipline. Several of the trade and industrial programs in the 2-year schools are structured in this manner.

II. NATURE OF THE STUDY

A. Purpose

From an overall viewpoint, this study has two broad purposes. The first and most immediate purpose was to determine the degree to which cooperative education is a viable educational and/or financial aid mechanism for institutions of higher education to adopt. The second purpose of the study was to determine the effectiveness of the Federal role in supporting cooperative education through Title IV-D of the Higher Education Act.

In order to meet the first goal, the study design was configured so as to include three substudies:

- an examination of the costs and benefits of cooperative education for the three key sets of participants: the student, the employer, and the institution;
- a determination of the degree to which cooperative education is a viable career education mechanism; and
- an assessment of the national potential for the expansion of cooperative education in postsecondary institutions.

Roughly 60 percent of the study's resources were devoted to these three substudies.

The second purpose generated a fourth and final substudy;

- an assessment of the Federal role in promoting the growth of postsecondary cooperative education programs.

The detailed findings of this substudy are also allocated a full chapter in the Final Report. In this document, the highlights of these findings are contained in Sections VI and VII.

B. Design and Methodology

This study has four primary areas of inquiry: an analysis of the costs and benefits of co-op for the three sets of participants, an assessment of the national potential for expansion of co-op in post-secondary institutions, an assessment of the role of cooperative education as a career education mechanism, and an assessment of the effectiveness of the HEA Title IV-D program as a Federal funding mechanism.

The analysis of costs and benefits of cooperative education was investigated primarily from the point of view of the student participant, and secondarily from the point of view of the educational institution and the employer. The most important student cost-benefit data actually came from graduates of the programs and graduates from the same schools and departments who had not participated in co-op. By comparing the earnings and career growth of the members of these two cohorts, it was possible to quantitatively assess whether the student costs for co-op participation--the largest of which is sometimes the need to stay in college for an additional year--are less than the benefits which are accrued through more successful experiences in the labor force and earnings received while in school and after graduation. When viewing cost-benefit from the standpoint of the employer, we were primarily interested in how the productivity and labor costs for the co-op workers compared to those for regular employees doing the same jobs. In determining institutional costs and benefits, we were mainly concerned with the resources required to support co-op programs versus the income derived from tuition and Federal grants. In addition, because not all benefits can be quantified, the analyses of all three cohorts referenced benefits which were definitely present but can't be associated with a dollar figure. With students and graduates, two important benefits of this type are satisfaction with one's career choice and with one's present job. For employers, a frequently mentioned non-pecuniary benefit is the building of a positive corporate image. For institutions, such a benefit, frequently listed, was increasing faculty members' knowledge of local business and industrial practices.

The assessment of national potential for expansion consisted of examining the feasibility for expansion in cooperative education programs. This study phase examined (1) the potential for expansion at present time, and (2) the factors which may aid or hamper future

expansion of cooperative education. Much of the information was provided by questionnaire items pertaining to benefits and costs of cooperative education. Responses by students, employers, and institutions as to their motivations to enter and continue with the program also provided valuable information.

Questions concerning career education were asked in order to determine whether cooperative education, as it is conducted today in postsecondary institutions, is really a viable career education experience. This was considered in the light of disparity of opinions as to what is career education. Types and qualities of experiences to which co-op students were exposed were documented. Information was also collected on how useful these experiences were in helping program graduates to select and pursue careers.

The assessment of Federal funding was aimed at exploring what effects there have been on cooperative education that are attributable to funding under the Title IV-D legislation. A major objective in this section of the analysis was to determine if Federal funds appeared to be necessary for stimulating the further development/expansion of cooperative education programs.

The first major step in designing the survey questions was to construct questionnaire items in direct response to the specific objectives of this study. This approach was pursued individually for the four study areas.

The next step was to convert questionnaire items that were organized by study area into a form in which questions were specifically addressed to particular types of respondents. Often, to help determine the validity of our data or to determine how different types of participants viewed the same question, the same item was asked of several different sets of respondents.

The final set of respondents used in the study and the number of responses received from each set were as follows:

Respondent Sets	
Senior Academic Officials	106
Fiscal Officers	102
Co-op Education Directors or presidents designates	106
Co-op Faculty Members	221
Non-Co-op Faculty Members	206
Co-op Students	1561
Non-Co-op Students	2304
Co-op Employers	236
Non-Co-op Employers	82
Co-op Graduates	1019
Non-Co-op Graduates	2212
Total Respondents	8185

These respondents were affiliated with 80 schools which were visited and 32 in which key administrators were queried by mail. The 112 institutions of higher education were broken out as follows:

48 co-op institutions receiving IV-D funding

16 co-op institutions not receiving IV-D funding

32 co-op institutions not receiving IV-D funding (queried by mail)

16 institutions not offering co-op programs

In addition to these breakouts, the sample was also stratified so that half of the schools were located in States with above-median unemployment, and half were in States with below-median unemployment. This was done so that the effects of the co-op program could be separated, at least partially, from the effects of a region's employment level.

Once at the school, an additional sampling variable employed was program area. In order to allow aggregation of economic data, the study only examined co-op programs from the following five academic areas:

- Business & Management, including Business Administration and secretarial science;
- Engineering & Architecture, including engineering technology and mining;
- Health professions, including paramedical technologies;
- Liberal Arts, including humanities and fine arts, physical sciences, mathematics, social and behavioral sciences; and
- Trade & Industrial (T&I), including applied arts and crafts and other vocational technologies.

Because the economic prospects and the working conditions are so different for persons graduating from programs in these different areas, nearly all of the student and graduate data generated by the study is broken out in this manner.

Field team interviewers began the data collection phase on March 29, 1976 and completed data collection in August of the same year.

The graduate samples were constructed by the field teams obtaining a listing from each site which contained names and last known addresses of 1970 and 1973 graduates by majors. Co-op schools were asked to provide a list of co-op and non-co-op graduates; if there were more than 50 names per year in the category for each program area,

a random sample was drawn. IHEs which did not have co-op graduates in 1973 were not included. Non-co-op schools were also requested to compile a listing of up to 50 names per area for each of the two years.

Most of the statistical analyses were carried out using a single software package, SPSS (Statistical Package for the Social Sciences). For the rate of return analyses, a previously developed Applied Management Sciences proprietary software package was utilized.

III. WHAT IS THE ESSENCE OF COOPERATIVE EDUCATION?

A. To What Extent is Cooperative Education a Career Education Mechanism?

This study found that, from the career education perspective, a postsecondary program that provides the student with a cooperative education experience is far more valuable to the student in terms of career selection and preparation than the same program would be without the cooperative education component.

Since the study data were also examined to determine whether these findings differed significantly on the basis of sex or race, we can also report that practically no differences based on these factors were found and that the career education aspects of co-op appear to benefit, to equivalent degrees, male and female students and minority and non-minority students.

In terms of program areas, the most intensive career education experiences appeared to be linked to students in the most applied areas--Health and T&I--with less intensive experiences accruing to students in the Business & Management and Engineering & Architecture cohorts, and the least intensive experiences being enjoyed by students from Liberal Arts backgrounds.

Examination of these data shows that the component of the co-op system that provides much of the career education is the employer, as opposed to the school. While it is certainly advantageous for the students to develop career skills and awareness of the work place, the data present the question of why the schools are not more actively involved in the career education process.

The school has the potential to contribute to the career education aspects of cooperative education by providing co-op students with intensive aptitude testing, counseling, and placement service. According to the data we collected, there appears to be few, if any, differences in the quality or quantity of these services being provided to co-op versus non-co-op students. Both groups rated the quality of these services lower than they rated any other services they received from their schools. Also, while nearly all co-op programs

reported that they provided counseling to students, the median hours of counseling received by students--according to the co-op directors--was six hours for co-op students and three hours for non-co-op students. Given the students' concern for career preparation, as was found in this study, it would appear that part of the schools' obligation to its co-op students should be more adequate provision of these services.

B. To What Extent is Cooperative Education a Vehicle for Financial Aid?

The study revealed that co-op earnings were essential to the continued schooling of many students and represented a financial aid source which institutions might be hard pressed to replace if co-op programs were to be discontinued. Perhaps the single most important piece of evidence was obtained by asking students what their alternative sources of income would be (if any) if they did not participate in co-op programs. What is particularly interesting is that, of the entire sample, only 6 percent indicated that no replacement of income would be necessary, and that this group was balanced off by the 6 percent of the students who stated that they would not attend college without co-op earnings. Examination of the individual cohort breakouts clearly indicates that minority and low income students--the most likely to need aid--would be the most unlikely to be able to replace co-op earnings by means of parental support, savings, or other student financial aid. This indicates that these sources were probably already being tapped to the greatest possible extent. Data were also collected to determine how students from different backgrounds rated the financial aid aspects of co-op in terms of its importance to themselves. The financial support purposes of co-op is significantly more important among males, minority students, engineering students, students from lower parental income backgrounds, students attending 4-year schools, and students at privately-controlled institutions. Of course, many of these characteristics are strongly interrelated--engineering students are primarily males, and minority students more often come from lower parental income backgrounds than non-minority students. In fact, it is the higher importance given to financial support by engineering students that accounts for the apparent difference between males and females. The higher importance of this aspect of co-op for engineering students is partly related to the fact that a higher proportion of engineering programs than any of the other program areas are in privately-controlled schools, which are much more expensive to attend. Both ethnicity and parental income have separate effects on this rating, although parental income has the stronger impact.

In summary then, the cooperative education program is a very effective means of providing financial aid to students. It is more effective than a loan program even when Federal support is provided to start such programs in the form of IV-D funds, and cannot be matched by any other financial aid mechanism after the program becomes self-supporting.

IV. IS PARTICIPATION IN CO-OP A PROFITABLE INVESTMENT FOR THE PARTICIPANTS?

A. For What Types of Individuals is Co-op Cost-Beneficial in Terms of the Long-Run Rate of Return Based on the Combined Student and After Graduation Experience?

In this study the rates of return to individuals who participated in the cooperative education program were compared with those of individuals who did not participate. In general, it was shown that the returns to postsecondary education were enhanced by participation in a cooperative education program. In fact, the returns are such that co-op participation was found to be financially rewarding even when such participation resulted in an additional year of schooling being required for graduation. At a discount rate of 10 percent, the mean present value of co-op education was about $8,000 greater than the present value of a non-co-op education, although considerable variation was observed among the student type-discipline area-program length combinations. The highest returns were consistently observed in 4-year, rather than 2-year, programs, and in the discipline areas of Business & Management and Engineering & Architecture, rather than Health Professions and Liberal Arts.

More specifically, all five of the available comparisons between co-op and non-co-op for 4-year programs showed that the cooperative education option is more profitable at all interest rates up to 35.0 percent. This result was found for males in Engineering & Architecture, males and females in Business & Management, and for males and females in Liberal Arts.

However, the same cannot be said for the 2-year program. Only three of the six available comparisons show the co-op program to be dominant (Business & Management for males, Health Professions for females, and Liberal Arts for males), with one of these (Business & Management for males) being preferred only up to an interest rate of 10 percent or less, while two other comparisons (Engineering & Architecture for males and Liberal Arts for females) indicate the inferiority of the co-op program.

In sum, this analysis demonstrates that the differential in financial rewards between co-op programs increases with program length. While there were mixed results for 2-year programs, co-op education was consistently dominant over non-co-op at the 4-year level. This indicates that, over the longer time period, co-op/non-co-op curricula differences do affect the graduate net benefit streams in favor of co-op education. In fact, this differential becomes substantial enough to allow 5-year co-op programs to dominate 4-year non-co-op programs--more than covering the costs of the additional year. These results hold for all sex and discipline area parameters where results were available.

B. In What Ways, and for What Types of Individuals, Are the Individual Components of the Total Co-op Experience Beneficial?

1. Financial Benefits of the Graduate Experience

An analysis was made of the mean graduate earnings for the first three years after graduation by sex discipline area and program length for the same sample of graduates that was used in the rate of return analysis. In terms of co-op/non-co-op comparisons, tests indicated that the mean earnings of co-op graduates were significantly higher (at a 95% confidence level) than those for non-co-op graduates when considering all graduates, male graduates, and those graduates of Engineering & Architecture programs. No significant differences were found between co-op and non-co-op graduates when considering only females, any of the three program lengths, or discipline areas other than Engineering & Architecture. Certainly, to a substantial degree, the earnings figures are consistent with the observed rate of return differences. The extent to which the student experience also contributes to these findings will be discussed in Section IV. B.2, below.

Also, the rate of career advancement, as measured by recorded salary increases, was considered. Many statistically significant differences were found by different levels of stratification, but three distinct patterns are evident. The first is that previous experience 1/pays off in terms of larger salary increases. The second is that, within levels of previous experience, the tendency is generally to have salaries grow so as to narrow starting salary differentials. The third is that no systematic pattern of greater salary growth by co-op participants than by non-co-op participants is apparent. Therefore, those initial salary differentials tend to be maintained (or, at least, don't show a significant tendency to either converge or diverge).

2. Financial Benefits of the Student Experience

Overall the findings indicate that students of all types benefit financially from the student component of the co-op experience. In examining this area several student cost and benefit elements were specified for this analysis. These elements were:

- student costs (books, tools, supplies);
- tuition;
- student taxable earnings; and
- student non-taxable income.

1/ Previous experience refers to the subset of graduates in the sample who had significant work experience prior to attending college.

The means for each of these variables were calculated according to each of the cohort-determining attributes. In addition, a net income figure for students was calculated by subtracting student costs and tuition from the student incomes. The most significant result was that taxable earnings were significantly higher (at a 95% level of confidence) for every co-op category than for the corresponding non-co-op category. As a result, co-op net income figures were significantly higher than those for non-co-op. Several other results were found which are consistent with the rate of return findings:

- Male students have significantly higher net incomes than female students, due largely to taxable earnings differences.
- Five-year programs provide significantly higher annual student net incomes than 4-year programs, and both provide significantly higher student net incomes per year than 2-year programs. This pattern holds for every net income subcomponent, except for tuition where 4-year programs have the highest per-year values.
- Engineering & Architecture provides the largest annual student net incomes, while Liberal Arts and Health Professions provide the lowest annual net incomes. These differences were due largely to variations in both taxable student earnings and tuitions.

It is clear that these findings support the earlier rate of return findings so that both the student and the graduate experiences are consistent with the rate of return calculations. In addition, the student co-op/non-co-op comparisons indicate quite clearly that the co-op program is an effective student aid device. While some variance was found in student costs, tuition, and non-taxable student incomes, the favorable differentials in student net income between co-op and non-co-op, are directly attributable to differences in taxable student earnings; i.e., co-op student earnings. Thus, regardless of sex, program length, or discipline area, co-op programs provide an important financial aid device for the participant.

3. Non-pecuniary Benefits of the Graduate Experience

Graduate experiences relative to job satisfaction, job responsibility, work continuity, and career plans were also examined in this study. No job satisfaction differences were statistically significant, nor were differences in job satisfaction observed among other sample stratifications (e.g., sex, race, GPA, program length, discipline area). However, some differences in levels of job responsibility were identified by co-op status. These differences indicated that co-op participation leads to somewhat greater job responsibility upon graduation. This is consistent with another finding that co-op participation is treated, in many respects, as similar to previous experience by the employer in terms of earnings.

Both co-op participation and previous experience displayed some tendency to reduce the period necessary to find the first job and to lower the probability of encountering periods of unemployment of six weeks or more. Part of the explanation for these findings relative to co-op participation is in the difference in sources that graduates use to find their first jobs. Those with no co-op experience lean heavily on outside contacts (e.g., agencies, ads, friends), whereas co-op graduates rely heavily on contacts with co-op employers and "in-school" efforts (school placement).

The examination of the co-op experience relative to career plans indicates that co-op participation provides first jobs which are more relevant to the college experience, and co-op participation continues to lead to a better match of college experience and job requirements after a few years. It is also clear from the limited analysis of this section that cooperative education may be a successful device to further career education goals. After a few years, co-op graduates view their current jobs as significantly more related to their career plans than non-co-op graduates.

Caution must be exercised with regard to these conclusions, however, in the case of 2-year Liberal Arts and Health Professions programs which are typically attended mostly by females. The findings with respect to these strata indicate that co-op education does not fulfill career plans anymore than does non-co-op education; and, in fact indicate a tendency for the opposite to take place. Certainly, this question bears further examination.

4. Non-pecuniary Benefits of the Student Experience

The examination of student attitudes and experiences uncovered some important and interesting co-op/non-co-op differences. Five advantages have been alleged for holding a job while in college. These advantages range from providing opportunities to try a variety of jobs and a chance to assume responsibility to making money to pay for college expenses and increasing the chances of getting a good job upon graduation. In each case, the co-op student rated these potential advantages as more important than did the non-co-op student. The only strata for which this relationship did not hold was for those students with previous experience and students in the discipline areas of Trade and Industrial and Health Professions. On the other hand, the co-op/non-co-op difference was very strong for non-white students and students in private schools.

These student responses, in general, are consistent with the findings regarding the level of overall satisfaction with the school program and the matching of the student work to the major. Co-op students indicated higher levels of satisfaction with the school program than non-co-op students, but the co-op/non-co-op differential

was not strong. (Both student groups were highly satisfied.) On the other hand, co-op students overwhelmingly indicated a strong relationship between the student job and the college major compared to non-co-op students. Thus, while the overall satisfaction with the college program was only marginally higher for co-op students, the relevance of the student job to the major was clearly better in the co-op programs.

When asked to describe the student job experience (both satisfaction and performance), the response patterns were significantly different between co-op and non-co-op students on eight out of the ten measures. Apparently both types of students "get to decide how things should get done on the job" and "get asked their opinions about work" with the same frequency. On the other hand, significantly fewer co-op students "can do their jobs without thinking," "associate with fellow workers after hours," or "require a replacement when absent." This indicates that co-op students are not in the mainstream. That is, they are given jobs that are specialized, not routine, generally postponable, and require independent thinking. This conclusion is also consistent with the findings that co-op students more often "learn something new each day," "learn things after work," "are told they have done a good job," "receive multiple assignments," and "get paid less."

The student ratings of the quality of their programs, according to ten program characteristics, produces several interesting findings. The co-op programs are rated "above average" according to all 10 characteristics; but the adequacy of the employers' facilities, the quality of employer training, the quality of college instruction, and the overall program quality rating were rated the highest of the 10. However, counseling for career planning received the lowest mean rating. Consideration of these rating items by various strata indicated that those with previous experience and those in new programs better appreciate the co-op structure of education. (Their ratings of the programs in terms of the quality of employer training and overall quality of the co-op programs were significantly higher than other students.)

Lastly, when co-op students were asked whether they would recommend the co-op program to other students, less than 3 percent indicated that they would not recommend the program to others, whereas almost two-thirds indicated that they would recommend co-op to all other students. This is an extremely strong testimony to the preference of student for cooperative education.

C. For What Kinds of Institutions Can Co-op be Operated in a Cost-Effective Manner?

An analysis was made of the impact of co-op on the institutional costs of educating students. The results of this analysis clearly show that, without some revenue generation activity on behalf

of the co-op program, the net costs of operating such a program can be substantial. While the figures vary by institution and program characteristic, the overall annual per student cost to the school is $511. Fortunately, the cost increases less than proportionally as the number of students increases, but the cost is still substantial. It was also found that reliance on tuition as the only revenue sources will, of course, reduce the net cost, but is not sufficient to run the program in the black. The total net cost under this assumption falls to $363. The financial position looks better for the larger programs on a per student basis because of the less than proportional income in total tuition benefits. On a total cost basis, however, they are probably worse. Only for program sizes outside of the range included in the sample is it likely that the total cost would be reduced, and the per student loss eventually turned into a net gain. It is remarkable, however, how much the mean net cost for private schools was reduced through the application of tuition revenues, so that the conclusions drawn above for all institutions relative to program size may not hold for private facilities. Their co-op programs may become economically viable using tuition as the only revenue source if they expand their size sufficiently.

The addition of outside sources of funding specifically earmarked for co-op (including Title IV-D grants) to the revenues produces the expected results. The net per student gain for co-op programs is $216 per student per year with all forms of revenues combined. The pattern is essentially the same as when considering the separate lump-sum tuition combinations, except that both lump-sum combined sources serve to cause an impact on public schools which matches the impact of tuition on private schools. The most striking feature of the total funding assumption figures is the small number of losses observed. The only true losses are for those schools not receiving outside funds and some programs in the middle size tertial. This is because these programs are large enough to spread out the fixed benefits but not large enough to yet take full advantage of the non-proportional increase in total incremental operating costs. The implications are clear: either stay small or expand beyond the middle tertial range (i.e., approximately 200 students).

In conclusion, therefore, it appears that the range of financing available for co-op programs is sufficient to at least cover the costs incurred as a result of the co-op programs. This conclusion is all the more important when it is recalled that the ADA funding, state and local revenues, and endowment income were not accounted. It is also clear that selected types of programs do not need to access the full range of sources to fully cover their operating costs. (E.g,, private schools charging tuition for co-op do not appear to need outside funding after reaching a certain size.) These conclusions, of course, assume that these sources continue to be available to each school, and this is not altogether certain. For example, IV-D funding

is critical to many program types, but cannot be relied upon as perpetual funding source. The same may be said of the other lump-sum funding sources. Only tuition can be relied upon and it is by itself not sufficient. There is some relief if the program is large enough to take advantage of the less than proportional increase in operating costs, but currently few programs are of the necessary size.

D. For What Kinds of Employers is Co-op Education Cost-Beneficial?

While there were some differences in terms of benefits required, overall employers of all types benefit substantially from participation in co-op. The investigation of costs incurred by co-op employers revealed that only two types of costs (start-up and evaluation costs) were higher, and only one cost (compensation) was lower for co-op employees than for non-co-op employees. All other cost items (supervision, union negotiations, customer relations, employee turnover) indicated no differences between co-op and non-co-op employees. Start-up costs--those costs related to negotiations with co-op schools upon initiation of a co-op program--are by definition associated only with co-op schools and are generally not large (on average about 5 hours per school). The extent to which evaluation costs for co-op employees exceed that for non-co-op employees was not measurable from the available data. However, since no appreciable difference in evaluation costs was seen between co-op and non-co-op employees when co-op students have been with the firm for more than a year, one may safely assume that the overall difference is not large.

The examination of co-op employer costs also revealed that roughly half of the co-op employers paid co-op student employees less than regular employees. This lower compensation included vacation and sick leave and other fringe benefits, as well as lower wages, and was more frequently the case for smaller firms. On balance then, in spite of the lack of any quantitative measure of these costs, one can readily say that co-op students cost many employers less than regular employees. One obvious response to the lower compensation observed for co-op employees relative to regular employees is that if one considers the productivity of each, then the compensation difference will be explained by lower co-op student productivity. Yet, when one compares the productivity of co-op students relative to regular employees (one of the benefit items examined), one finds quite the opposite--co-op students performed better than regular employees in seven of the eight skill areas examined. In fact, the co-op student employees performed sufficiently well to increase the motivation and productiveness of other employees.

A separate analysis of the benefits of employer participation in cooperative education identified positive benefits in two other important areas. In terms of recruitment, the majority of employers indicated that a very important benefit of co-op participation was that it aided them in finding potential permanent employees. This recruitment benefit (i.e., lower recruitment cost) was particularly

important to larger firms. In fact, two-thirds of the firms that employ 500 or more persons reported that finding potential permanent employees was very important to them, and over 98 percent responded that it was at least somewhat important. In the area of community relations, the majority of employers reported that their participation in co-op was a very important benefit to them. This was the case in every aspect of community relations--community service, public relations, and in making schools more responsive to the needs of business.

Thus, on balance, the costs and benefits indicated that, while the costs of co-op participation to the employer are minimal, the benefits (cost savings) are substantial. Therefore, it is not surprising that employers of co-op students rate the co-op program above average in more than 19 out of 20 cases, and plan to expand their co-op participation in almost half of the cases. Clearly, co-op employers view co-op students as a sound economical source of manpower.

V. WHAT ARE THE LIMITATIONS ON THE EXPANSION OF CO-OP IN THE UNITED STATES?

A. Are There Too Many Co-op Programs in Existence?

There is no evidence to indicate that there are too many co-op programs. While co-op exists at over 1,000 IHEs, this represents only about one-third of the institutions of higher education in the United States. Additionally, most of these programs involve only small numbers of students, and overall the students enrolled in postsecondary co-op programs constitute perhaps 2 percent of the total number of students attending institutions of higher education. The most critical concern in being able to support the existence of co-op programs is adequate numbers of work experience slots for the students. The evidence seems to indicate that not only can current co-op operations be supported, but that continued expansion is also possible.

A comparison of the average number of new employers contacted who agree to participate with growth in co-op student enrollment provides no indication that the employer utilization of co-op student manpower hinders the future growth and development of co-op The overall median growth in co-op student enrollment during the years under study was about 25 students. Since our data indicate that the typical first-year employer hires 2-1/2 students, then the 8-10 new employers enlisted on the average would indicate an increase, from this source alone, of about 20 to 25 new co-op work experience slots each year. Since in most co-op programs not all students are out on co-op jobs simultaneously, then this growth alone is definitely ample to allow for continued growth in co-op student enrollment of the present rate. In addition, co-op employers also hire increasing numbers of students as the length of time they have participated increases. In the second through fifth years of association with a co-op program, the average employer has increased the extent of participation to five

students. Thus it seems clear that the employer utilization of co-op student manpower is sufficiently robust as to allow for even an accelerated rate of growth of cooperative education.

B. Is There an Unmet Demand for Cooperative Education by:

1. students,

2. employers, and

3. institutions?

While co-op appears to be in a very healthy state and is generally expanding, no evidence exists that there is an unmet demand for for cooperative education from any of the three groups that cannot be satisfied with the current rate of growth. In fact, most institutions felt they could accommodate additional co-op students in their programs. Also, none of the employers not participating in co-op indicated that they had a desire to participate that could not be accommodated.

C. What Are the More Effective Means of Promoting the Further Growth of Co-op Vis-a-Vis:

1. students,

2. employers, and

3. institutions?

What appears to be the most effective means of promoting the growth of co-op among all these participants is a vastly expanded program of dissemination of information about co-op and its benefits. For example, the three predominant reasons for lack of co-op participation by non-co-op employers do not seem to present significant obstacles to co-op expansion. They are the inadequate knowledge possessed by employers concerning the nature of co-op programs, the perception of an increased financial burden being imposed on the firm as a result of participation in co-op, and the inability of firms to feel they can develop, on their own, co-op work experiences beneficial to both the employer and the co-op student. As this study has shown, employers of co-op students generally reap a large increase in benefits for a relatively small amount of cost by their participation. Thus, the reasons which underly most of the unwillingness of employers to participate in co-op generally stem from perceptions rather than fact. Thus, with increased effort devoted to dissemination of information regarding the benefits to employers resulting from participation in co-op, the employer utilization of co-op student manpower should be capable of allowing for the continued expansion of cooperative education.

Similarly, it appears that by providing students with more information on the benefits of co-op and by possibly providing co-op offerings in new areas, institutions could substantially increase their co-op enrollments without straining their programs' capacities. Given the relatively low cost of these activities and the cost-savings accruing to larger programs, such dissemination activities should be extremely effective.

VI. WHAT HAS BEEN THE ROLE OF FEDERAL FUNDING IN THE DEVELOPMENT OF CO-OP?

A. Do Cooperative Programs Differ by IV-D Versus Non-IV-D Funding?

The overall conclusion that can be drawn from the data collected in this study is that, by and large, co-op programs funded by Title IV-D show no consistent or significant pattern of differences from those programs not receiving these funds. In a few limited specific instances, there appears to be at least a tendency toward some variation in program features between these program types, which will be mentioned briefly below. Nevertheless, in terms of institutional characteristics, program operational features, or perceptions of success, Title IV-D does not appear to have greatly impacted on the general nature and structure of cooperative education.

While we have noted that differences are minimal and the variability within categories of schools is extremely large, some important trends should be noted.

First, the co-op enrollments at IV-D institutions increases while those at non-IV-D schools seem to remain stable or even show a decline. This is probably due to the fact that the IV-D programs are much newer, rather than to differences in quality.

Additionally, one area in which IV-D funds appear to have had some impact is in the support of co-op in the more non-traditional program areas of Liberal Arts and Trade & Industry (T&I). Cooperative education was started in the engineering area and has also been fairly well established in the business areas. Co-op programs in Liberal Arts and T&I are a relatively recent phenomenon, and it appears that IV-D programs have not encourged the growth in those areas. While our data are not definitive, it does seem that this has occurred in schools with established co-op programs as well as the schools which have only recently initiated programs.

However, in terms of the services provided to the students, as counseling and placement, there were no significant differences between IV-D and non-IV-D programs. Also, the role of the co-op director in terms of his position in the institution or the structuring of his responsibilities are not different for these two types of programs.

In most cases there are no statistically significant differences in program quality, as measured by the students' perceptions, between the different types of co-op programs. In the very few cases where some differences do occur, the newness of the program rather than its funding source appears to be the major factor in explaining the higher rating given those components by the students.

In terms of the employers' ratings of the overall quality of the co-op programs with which they are associated, there are again no statistically significant differences between the IV-D and the non-IV-D institutions.

In summary then, programs which have received Title IV-D funds are very similar to those that have not received such funds. This is not to be taken as an indictment of the Federal program. As is shown elsewhere in this report, in general, co-op provides substantial benefits to its participants. Therefore, the major impact the IV-D program has had on the growth of cooperative education is in itself a positive contribution to higher education. However, if it is now considered appropriate to expand the Federal role to include promoting improvements in the quality of cooperative education programs, then the implications are that some changes in Federal policy would be desirable. As has been shown in the Final Report, the area in which co-op seems to be most in need of improvement is in terms of activities and experiences, especially those provided by the schools, which would promote better career choices by the student. Given that IV-D monies presently go to the IHE, it would seem that in this area, relatively minor changes in Federal policies and procedures could have significant impact, such as putting more requirements and restrictions on the use of monies to support career development activities.

B. How Has IV-D Impacted on the Growth of Co-op?

Based on the data collected in this study, it is evident that the IV-D funds have had a profound impact on the number of postsecondary co-op programs existing and on the types of institutions and programs which are presently offered. Specifically IV-D funds have contributed greatly to the growth of co-op in 2-year schools and in some of the emerging co-op program areas such as Liberal Arts, T&I, and Health Professions. They have also induced large numbers of institutions to experiment with the co-op concept, and virtually all of the co-op directors and the senior academic officials interviewed feel that these programs will be continued after the IV-D funding has ended.

Among the programs which started co-op with IV-D funds, the vast majority (86%) stated that without the Title IV-D grant, the cooperative education program would not have been initiated. Thus, it seems clear that the Federal monies were needed, and that the recent surge in the number of schools offering co-op would not have come about without the Federal involvement in the form of the Title IV-D program.

VII. PROGRAM AND POLICY IMPLICATIONS

A. What Are the Parameters of a Viable Co-op Program?

This study has shown that the great majority of the undergraduate programs are viable for nearly all types of undergraduate institutions and students, as well as for virtually every kind of employer included in the study.

In the case of undergraduate institutions, we learned that co-op programs appear to be able to operate in most schools in such a manner that the income they generate at least covers the program expenses, provided that the programs are either relatively small in size or else are comparatively large, It is primarily when programs are just getting started, or when they are caught inbetween the optimum size ranges, that outside funding is needed for them to operate on a break-even basis. We also learned that in the institutions, the programs appear to be highly regarded as career education mechanisms and to be providing valuable service as financial aid mechanisms as well.

Regarding students, we were able to use lifetime earnings stream data to show that for every program area in the 4-year and 5-year schools included in the study, participation in co-op resulted in graduates more than recovering the opportunity costs of participating in co-op and being hired into higher paying jobs which were more closely related to their vocational interests. Similar results were obtained for some program areas in 2-year schools. In fact, the only group which appeared not to benefit from co-op participation was students entering college with significant employment experience gained prior to entry.

In the case of employers, we were able to show that co-op students typically perform as well, or even better, than their non-co-op counterparts and in about half of the cases, receive lower pay and benefits. We found the pay differences to be more common among the smaller firms, but we found the larger firms reap additional benefits through the use of co-op as a recruiting mechanism. Over one-third of the co-op graduates included in this study eventually accepted jobs with one of their co-op employers.

B. What Role, if Any, Should be Played by Federal Support of Co-op in the Future

The most valuable service which the IV-D legislation has rendered to the educational community in the past is providing support for co-op programs which are either just getting established or else are trying to make the transition from being a small program to becoming a large one.

Based on our findings relating to co-op's effectiveness as a means of providing career education, as a means for facilitating satisfactory placements of college graduates, as a fimancial aid mechanism, and as a source of valuable labor for employers, becoming associated with cooperative education programs appears to be in everyone's interest for increasing numbers of students, institutions, and employers. Yet, according to our calculations, it does not appear likely that, by 1980, even 10 percent of the American undergraduate student population will include this valuable perogram in their course of study.

Because this estimate is based on continued support for cooperative education under the Higher Education Act, and because such support has proven to be such an effective instrument of growth, we feel that the modest amount of funding now being provided should be continued. Considering the benefits provided by cooperative education and the sizeable degree of expansion which appears possible, serious consideration should be given to providing additional support so that additional programs could be initiated.

We would propose that this be done in two ways by:

- funding additional institutions wishing to establish or enlarge their co-op programs; and
- providing assistance for dissemination projects aimed at informing students, employers, and academic officials of the benefits accruing to participants in cooperative education programs.

The rationale for the first strategy is apparent: this is the activity which IV-D has proven to be highly effective in accomplishing. The rationale for the second strategy emerges from the study's findings which addressed nonparticipation in co-op. For students, faculty, and employers alike, the main reason given for nonparticipation was always either lack of awareness or lack of accurate information.

The study also showed that many institutions report a sizeable amount of excess capacity in their co-op programs. We suggest that this capacity could be utilized by providing the types of outreach activities mentioned above as well as by considering an additional course of action aimed directly at increasing the number of disadvantaged and/or minority students participating in co-op programs.

The course of action would be to modify existing grant-in-aid regulations so that students would not have other forms of support reduced because of co-op earnings. Given co-op's value as an educational device and a placement aid, such a course of action appears highly justified, and it might easily result in a strengthened demand for co-op among the populations that USOE has declared to be priority target groups.

Two other implications relate to funding priorities. This study has identified career counseling as being one of the weakest components in the co-op system when student expectations are contrasted with institutional resource allocations. We suggest that the guidelines be modified to reflect an increasing concern with vocational aptitude testing and career counseling, and the linkage of these processes to the co-op placement and graduate placement processes. Similarly, we suggest that the guidelines be modified so that the movement of programs into certain size categories can be encouraged so as to promote cost-effectiveness in operation.

Finally, we strongly suggest that the funding actions of the different USOE sources of support for co-op be coordinated so that schools are not able to accrue more aid than is truly needed by applying to several different sources for support for the same program. At a very minimum, HEA and VEA support for co-op needs to be coordinated at the 2-year college level.